

### **REMARKS**

The Examiner's continued attention to the application is noted with appreciation. Note that the amendments to claims are made for stylistic reasons unrelated to statutory grounds of patentability.

#### **Claim Objections**

In the Office Action dated October 10, 2007, the Examiner objected claims 1-8 and 10-17 because of the use of "namely" could be interpreted as being a preferred embodiment. Claim 1 has been amended replacing "namely" to "wherein" which traverses the objection.

Further, this application is directed to how to generate an energetic material composition that produces hydrogen gas as a reaction product by the inclusion of metal hydride reactants. The Sheridan et. al. copending application (10/923,865) is directed to how to generate an energetic material that produces elemental phosphorus as a reaction product by inclusion an oxide of phosphorus reactant. It is the result of the chemical reactions (i.e. the generation of hydrogen or elemental phosphorus) based on the claimed compositions that are patentable. As is well known in the art material innovation in many electronic devices, pharmaceuticals, ceramics, and coatings, etc., are formed using similar oxidation/reduction reactions with vastly different results.

#### **Claim Rejections Under 35 USC § 112**

The Examiner rejected claims 1-8 and 10-21 and stated that the claims contain subject matter which was not described in the specification to show possession of the claimed invention. The Examiner further stated that "the mere absence of a positive recitation is not basis for an exclusion" (*Ex parte Graselli*, 231 USPQ 3693, F.2d 453 (Fed. Cir. 1984)).

As stated in the August, 2007 response, Applicant's invention is directed to non-adducted metal hydrides is inherent in the disclosure and figures, particularly Fig. 4, page 4 lines 22-23, and page 5, lines 20-25, and one of ordinary skill in the art would so read and understand the disclosure. The disclosure specifically states that "the invention is capable of doing work by the liberation of a gaseous reaction product, such as hydrogen." (see page 4, lines 22-23). A non-adducted metal hydride is one that uses a process including but not limited to desorption, where the hydrogen is released, rather than through an addition reaction (adduction reaction). Or again on page 5, lines 21-22 specifically read "Upon initiation of the thermite reaction, for example, the hydrogen will be released as a hot gas." Therefore, one of ordinary skill in the art would understand that the metal hydrides used would be non-adducted metal hydrides.

As held by *Ex parte Robert E. Parks and Robert L. Marrieta*, Appeal No. 93-2740, September 2, 1993, Board of Patent Appeals and Interferences Patent and Trademark Office, in review of an Examiner's rejection based on *Graselli*, "it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an appellant had possession of the concept of what is claimed. *In re Anderson*, 471 F.2d 1237, 176 USPQ 331 (CCPA1973). Clearly, the observation of a lack of literal support does not, in and of itself, establish a prima facie case for lack of adequate descriptive support under the first paragraph of 35 U.S.C. 112. *In re Herschler*, supra; *In re Edwards*, supra; *In re Wertheim*, supra. We are not unmindful of the decision in *Ex parte Grasselli*, 231 USPQ 393 (Bd.App.1983) aff'd mem., 738 F.2d 453 (Fed.Cir.1984), which involved claims to a process for the ammoxidation of propane or isobutane employing a catalyst "free of uranium and the combination of vanadium and

phosphorus." Under the particular facts in that case, it was held that the negative limitation introduced new concepts in violation of the description requirement of the first paragraph of 35 U.S.C. 112, citing *In re Anderson*, supra.

In the situation before us, it cannot be said that the originally-filed disclosure would not have conveyed to one having ordinary skill in the art that appellants had possession of the concept of conducting the decomposition step generating nitric acid in the absence of a catalyst... Thus, it cannot be said that the originally-filed disclosure would not have conveyed to one having ordinary skill in the art the concept of effecting decomposition at an elevated temperature in the absence of a catalyst." *In re Anderson*, supra.

Similarly, knowledge of hydride adducts was well known in the art at the time of invention and original disclosure. The limitation was provided as a clarification regarding the continued assertion that one skilled in the art would infer that the function of non-adducted hydrides in energetic compositions are predicted from Danen et. al. teaching the use of adducted hydrides. Extrapolation of this argument to other thermodynamic systems is analogous to the idea that the oxidation/reduction behavior of pure iron could be inferred from the oxidation/reduction behavior of hemoglobin (an adducted form of iron). This is not the case since the chemical potential of the iron is affected by the matter around it. In the oxidation/reduction based energetic system disclosed by Danen et al., the process of adducting a hydride would greatly reduce the hydrogen gas formation per unit volume of composition. Applicant's invention is useful as an energetic composition for the very reason that it maximizes the hydrogen gas formation.

Therefore, independent claims 1 and 18 as amended are definite and do not claim new

matter. Claims 3 through 8, 10 through 17 depend on claim 1, and claims 19 and 20 depend on claim 18 respectively. Accordingly, claims 1, 3-8 and 10-21 are now in condition for allowance.

*Claim Rejections Under 35 USC § 103(a)*

The Examiner rejected claims 1, 3-8 and 10-21 as being obvious over Danen et al. (U.S. Patent No. 5,266,132). For the examiner to be correct in this argument it is necessary to accept that Danen does teach the use of non-adducted hydrides. However, Danen et al. never state the use of non-adducted hydrides anywhere in the patent. The Examiner refers, on several instances, to a list of non-hydride fuel metals "... and hydrides thereof." This is a misrepresentation of what is taught by Danen et al. The obviousness of the use of pure metal hydrides is only seen after recognition that optimizing hydrogen content is of value. As stated above Applicant's invention as an energetic material is based the optimization of hydrogen content in a thermitic composition. Danen et al. do not teach, anticipate or infer the optimization of hydrogen or any of Applicant's invention.

Danen et al. do reference the use of an adducted form of a specific hydride to create a high temperature gas. The disclosure teaches the use of the adducted hydride in a three layer system. One skilled in the art would recognize that the use of the Al and CuO layers are intended to provide the thermal energy necessary to drive the decomposition and subsequent oxidation of the third adduct containing layer. Applicant's disclosure is fundamentally a different form of matter in that it teaches that only two layer systems are necessary to be a gas former, a metal hydride and an oxidizer. The adducted metal hydride described by Danen et al. would not result in a self propagating reaction when used only with the CuO. Danen et al. do not

anticipate the use of pure metal hydrides as the fuel portion of the oxidation reduction pair.

The Examiner stated that absent of teaching or showing the criticality of the metal hydrides being non-adducted the patent is not distinguishable from Danen et al. However, as stated above, Danen et al. teaches the oxidation reduction pair would not self propagate. This is a distinguishable and critical difference between Applicant's invention and Danen et al.

The Examiner states that claims 7-8, 10-11 and 18 – 20 are anticipated by Danen et al. and references col. 5 ln. 9-44. The language "... and hydrides thereof" does not appear in the referenced patent and is not taught, anticipated or inferred. This addition of that language, "... and hydrides thereof", changes a fundamental teaching of Danen et al. to incorporate the claims of this disclosure. In addition, the adducted hydride as disclosed by Danen et al. could not be formed by sputtering deposition as the hydride adduct would be disassociated into components and not reform on the surface as the adduct. (The deposition method would have to be chemical vapor deposition.) This is a distinct manufacturing difference between what Danen et al. teaches and the claims of this disclosure.

The criticality and difference is the presence of the hydride. Non-adducted metal hydrides combined with an oxidizer will generate a self propagating reaction. Adducted metal hydrides will not. This results in the potential of substantial differences in the work potential of the materials. Applicant's invention is directed to non-adducted metal hydrides and this is a critical distinction. Therefore, Applicant has traversed any rejections based on obviousness in regard to independent claims 1 and 18.

Because claims 3-8 and 10-17 are dependent on patentable independent claim 1, and claims 19-20 are dependent on patentable independent claim 18, all the claims are now in condition for allowance.

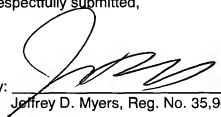
Authorization is given to charge payment of any additional fees required, or credit any overpayment, to Deposit Acct. 13-4213. Also being filed herewith is a Request for Continued Examination with the appropriate fee.

An earnest attempt has been made to respond to each and every ground of rejection advanced by the Examiner. However, should the Examiner have any queries, suggestions or comments relating to a speedy disposition of the application, the Examiner is invited to call the undersigned.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

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